

## REMARKS

In view of the comments below, Applicant respectfully requests that the Examiner reconsider the present application including rejected claims, as amended, and withdraw the outstanding claim rejections. Currently claims 40-59 are pending.

### *Claim Rejections 35 USC § 103*

The Examiner has rejected claims 40-58 under 35 U.S.C. § 103(a) as being allegedly unpatentable over United States Published Patent Application No. 2004/0185775 A1 to Bell et al. ("Bell") in view of United States Patent No. 6,381,228 to Prieto et al. ("Prieto"). Applicant respectfully traverses this rejection.

Claim 40 recites "a forward payload section including a forward processing module and a forward amplifier, the forward payload section for handling the analog payload," and "a return payload section including a return processing module having an arbitration processor and a return amplifier, the return payload section for handling the digital payload." These features are not disclosed or suggested in either of Bell or Prieto, alone or in combination.

The Examiner has asserted that Bell discloses a hybrid satellite (e.g., in the abstract, and paragraphs [0004], [0007], [0011], [0012], [0029]-[0034], [0041], [0048], [0055], and claim 20). However, a careful examination of these and other portions of Bell will show that this is not an accurate characterization of what Bell teaches and suggests.

In particular, Bell specifically discloses "*an all-digital satellite payload,*" that includes "both digital transponded and digital regenerative functions." Bell notes that by combining transponded and regenerative functions into *a common digital platform*, numerous efficiencies of scale are realized, and the overall efficiency and functionality of the satellite is dramatically

improved. (See, e.g., Bell, paragraph [0010].) Thus, Bell does not disclose a hybrid analog/digital payload. Rather, it very specifically discloses an entirely digital payload.

The Examiner asserts that Bell shows a satellite that handles both digital and analog data. From this assertion, he then concludes that Bell is a hybrid payload satellite. However, this is not a proper characterization of what Bell shows. The Examiner specifically cites paragraphs [0004], [0005], [0029], [0030], [0032], and [0055], as well as claim 20 as allegedly showing analog/digital circuitry function. Applicant will consider each of these cited sections in turn, by way of example.

Paragraph [0004] simply discloses that a satellite may include one or more "transponders", which are clusters containing one or more radio receivers, frequency translators and transmitters. It notes that these transponders are collectively referred to as "the payload" of the satellite. (See, e.g., Bell, paragraph [0004].) But it offers no disclosure or suggestion as to whether these transponders perform analog or digital operations.

Paragraph [0005] simply discloses that a typical analog transponded communications payload receives multiple uplink beams from the earth or another satellite via an uplink antenna. It notes that each of the received beams is amplified with a low noise amplifier (LNA) and down-converted (D/C) for further processing, and that the down-converted beams can then be switched, multiplexed (MUX) or otherwise routed and combined prior to upconversion and re-transmission on a downlink beam to the earth or another satellite. But this refers to a prior art, totally analog payload system. Nothing in this portion of the Bell discloses or suggests anything about a hybrid system.

Paragraph [0029] discloses a payload 200 that includes any number of input amplifiers 206A-n, optional downconverters (D/C) 208A-n, output amplifiers 210A-I, output switches 212A-j and output multiplexers 214A-k that are arranged to interoperate with a digital

transponder unit 202 to provide digital processing of input beams 204A-n and to create output beams 216A-n that are transmitted to a receiver at another satellite or at the earth's surface via a suitable antenna. But as acknowledge in this paragraph, the payload 200 operates to "provide digital processing of input beams 204A-n." Thus, this paragraph describes digital processing, not analog processing.

Paragraph [0030] discloses that in operation, a number of input beams 204 are received via a suitable antenna. Each of these beams may be filtered to isolate an appropriate band of frequencies (i.e. "sub-bands" or "channels") to be amplified by a low noise amplifier (LNA) or other input amplifier 206 to improve the strength of the received signal. The amplified sub-band is then down-converted from the received frequency to a suitable intermediate frequency (IF) for digital processing. (See, e.g., Bell, paragraph [0030], and FIG. 2.)

This paragraph thus identifies digital processing, not analog processing. And although it does disclose the use of analog-to-digital converters (ADCs) to sample incoming sub-bands, such operations are not the same as handling an analog payload, as recited in Applicant's claim 40. Rather, the ADCs are used to reduce or eliminate the need to down convert the amplified sub-bands by sampling incoming sub-bands at rates as high as 550 MHz or greater. In other words, the ADCs are used as an alternative to down converting circuitry for the amplified sub-bands.

Paragraph [0032] refers to the output sub-bands assembled by digital transponder unit 20. It refers to the output powers of these sub-bands, and notes that the outputs of some or all of the output amplifiers 210 may be switched, multiplexed together at output multiplexers 214, and then re-transmitted through the transmit antennas to form output beams 216. But, nothing in this disclosure discloses or suggests analog processing of any sort.

Paragraph [0055] discloses an embodiment in which even the A/D converters are eliminated. In particular, it notes that in another embodiment, the digital signal processing

capabilities of payload 202 can be expanded to incorporate direct beam forming, essentially creating an all-digital satellite payload 800. Such embodiments typically do not require downconvert or output multiplexing capabilities, since the digital payload 202 is able to directly interoperate with phased array and/or other antennas to process uplink data and to form downlink beams ready for transmission. In such embodiments, digital payload 202 receives the analog baseband signals from the input amplifiers 206, and provides output signals to output amplifiers 802 in analog form. (See, e.g., Bell, paragraph [0055], and FIG. 8.) Thus, in this disclosed embodiment, there aren't even A/D or D/A converters, and the entire processing is performed digitally.

Claim 20 recites receiving a plurality of uplink beams and producing a plurality of downlink beams, the satellite comprising: an uplink antenna configured to receive the plurality of uplink beams; a downlink antenna configured to produce the plurality of downlink beams; an analog-to-digital (A/D) converter configured to convert the uplink beams to digital uplink equivalents; [a variety of elements to perform digital processing]; and a digital to analog (D/A) converter configured to convert digital output sub-bands to downlink beams transmitted by the downlink antenna. (See, e.g., Bell, claim 20.)

The Examiner seems to assert that since the satellite disclosed in Bell may include ADCs, it therefore clearly shows receiving and amplifying an analog transmission, and afterward forwarding it as a digital transmission. From this, he concludes that the satellite therefore shows receiving and amplifying an analog transmission and afterward forwarding it as a digital transmission.

But as noted above, while Bell may include ADCs in its circuitry, these ADCs are not necessarily used to convert an analog transmission to a digital transmission. They are disclosed for the purpose of sampling amplified sub-bands at very high frequency to reduce or eliminate

the need to down convert the amplified sub-bands. In some embodiments, this may be an entirely digital operation performed on entirely digital incoming signals.

And even if there are embodiments in which an incoming analog signal is converted to a digital signal for processing, and is then converted back to an analog signal for final transmission, the resulting circuit would still not disclose every element of Applicant's claim 40. In particular, simply including ADC circuitry and DAC circuitry would not show "a forward payload section including a forward processing module and a forward amplifier, the forward payload section for handling the analog payload," as required by claim 40. ADCs and DAC alone cannot be considered a forward processing module and a forward amplifier.

In all of these cited portions of Bell, as well as the non-cited portions of Bell, the only analog signals are the those received by and transmitted from the disclosed satellite. All internal processing, aside from an initial A/D conversion and a final D/A conversion, are digital operations. Thus, Bell does not disclose a hybrid system in which a forward payload section handles an analog payload, and a return payload section handles a digital payload, as required by claim 40. Specifically, it does not disclose or suggest a forward payload section including a forward processing module and a forward amplifier, the forward payload section for handling the analog payload. Rather, it shows an all-digital satellite payload, that does not perform analog payload handling.

Prieto does not cure this deficiency. In particular, nothing in Prieto discloses or suggests a hybrid payload satellite including a forward payload section including a forward processing module and a forward amplifier, the forward payload section for handling the analog payload; and a return payload section including a return processing module having an arbitration processor and a return amplifier, the return payload section for handling the digital payload, as

required by claim 40. Thus, none of Bell alone, Prieto alone, or Bell and Prieto in combination disclose or suggest all of the elements of a hybrid payload recited in claim 40.

Claims 41-48 depend variously from claim 40, and are allowable for at least the reasons given above for claim 40.

The Examiner has cited the same portions of Bell and Prieto for the rejection of claims 49-58 as he did for the rejection of claims 40-48, and Applicant traverses this rejection for similar reasons to those given above for claims 40-48. In addition, in an effort to expedite prosecution, and in no way acquiescing to this rejection, Applicant has amended claim 49 to better recite the present claimed invention.

Amended claim 49 recites an analog payload section including an analog processing module and an analog amplifier, the analog payload section for performing entirely analog payload processing on downlink signals from at least one of the plurality of user terminals to the content provider; and a digital payload section including a digital processing module and a digital amplifier, the digital payload section for performing entirely digital payload processing on uplink signals from the content provider to at least one of the plurality of user terminals. These features are not disclosed or suggested in either of Bell or Prieto, alone or in combination.

In particular, nothing discloses or suggests an analog payload section for performing *entirely* analog payload processing on downlink signals from at least one of the plurality of user terminals to the content provider, and a digital payload section for performing *entirely* digital payload processing on uplink signals from the content provider to at least one of the plurality of user terminals. According to the Examiner's interpretation of Bell and Prieto, the combined device would perform a mix of analog and digital processing on every signal, and would not perform entirely digital processing on one type of signal and entirely analog processing on another type of signal, as required by amended claim 49.

Claims 50-58 depend variously from claim 49, and are allowable for at least the reasons given above for claim 49.

Therefore, based on at least the reasons given above, Applicant respectfully requests that the Examiner withdraw the rejection of claims 40-58 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Bell in view of Prieto.

The Examiner has rejected claim 59 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Bell in view of Prieto, further in view of United States Patent No. 6,400,696 to Hreha ("Hreha"). Applicant respectfully traverses this rejection.

Claim 59 depends from claim 49, and is allowable for at least the reasons given above for claim 49. Nothing in Hreha cures the deficiencies in Bell and Prieto disclosed above.

Therefore, based on at least the reasons given above, Applicant respectfully requests that the Examiner withdraw the rejection of claims 59 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Bell in view of Prieto, further in view of Hreha.

### ***Conclusion***

Applicant respectfully submits that, as described above, the cited prior art does not show or suggest the combination of features recited in the claims. Applicant does not concede that the cited prior art shows any of the elements recited in the claims. However, applicant has provided specific examples of elements in the claims that are clearly not present in the cited prior art.

Applicant strongly emphasizes that one reviewing the prosecution history should not interpret any of the examples Applicant has described herein in connection with distinguishing over the prior art as limiting to those specific features in isolation. Rather, for the sake of simplicity, Applicant has provided examples of why the claims described above are distinguishable over the cited prior art.

In view of the foregoing, Applicant submits that this application is in condition for allowance. A timely notice to that effect is respectfully requested. If questions relating to patentability remain, the Examiner is invited to contact the undersigned by telephone.

Although it is not anticipated that any additional fees are due or payable, the Commissioner is hereby authorized to charge any fees that may be required to Deposit Account No. 50-1147.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Brian C. Altmiller", written over a horizontal line.

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